

Table 3. Observation rates of 6 raptor species (birds/hr) at lower Salmon and Snake River survey points 1993, 1994, and 1996.

Point	Golden Eagle			Red-tailed Hawk			American Kestrel			Bald Eagle			Prairie Falcon			Northern Harrier		
	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996
1	2	2	2	1.00	0.50	1.50	2.00	0.00	1.00	0.50	0.00	0.00	1.00	1.00	0.00	0.50	2.00	0.00
2	2	2	2	1.00	0.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
3	2	2	2	1.50	1.00	0.50	0.00	0.25	1.50	0.00	0.00	0.00	1.00	1.00	0.00	0.50	1.50	0.00
4	2	2	1.92	1.00	1.50	0.52	0.00	1.00	0.52	0.50	0.50	1.04	0.00	0.00	0.00	0.50	0.50	1.56
5	7	2	1.75	0.57	0.50	0.00	0.57	1.00	2.29	0.00	0.00	0.00	0.14	0.00	0.57	0.00	0.00	0.00
6	1	2	1.83	1.00	0.50	1.09	2.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
7	1	2	1.5	1.00	0.00	2.00	2.00	1.00	0.00	1.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00
8	1.5	2	2	2.67	0.00	1.50	0.00	0.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00
9	1.5	2	2	0.67	0.00	1.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
10	1.5	2	2	0.67	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	3	2	2	0.67	0.50	1.00	1.33	0.00	0.00	0.33	0.50	0.00	0.00	0.00	0.00	0.33	0.00	0.00
12	3	2	2.5	1.33	1.50	1.20	0.67	1.00	0.00	0.33	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.40
13	3	2	2.5	0.33	1.00	0.80	0.33	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
14	1.5	2	2	0.00	0.00	0.50	1.33	0.00	0.00	0.67	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00
15	1.5	2	1.5	0.00	0.50	0.00	2.67	1.00	0.00	0.67	0.50	0.67	0.00	0.00	0.00	0.00	0.00	0.00
16	4	2	2.25	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.50	0.00	0.00	0.00	0.00	0.00
17	1.5	ns <sup>a</sup>	2	0.67	ns	1.00	0.00	0.00	1.50	0.67	ns	0.00	0.00	0.00	0.00	0.00	ns	0.00
18	1	2	2	1.00	3.50	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.50	0.00
19	2	2	2	0.50	0.50	1.00	0.00	0.00	2.00	1.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
19A	ns	2	ns	ns	1.50	ns	ns	0.00	ns	ns	0.50	ns	ns	0.00	ns	ns	0.00	ns
20	9	2	2	0.11	1.00	0.50	0.11	0.50	0.50	0.22	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Average	2.55	2	1.99	0.81	0.73	0.73	0.68	0.39	0.52	0.39	0.13	0.36	0.01	0.00	0.03	0.13	0.10	0.09
S.D.	2.04	0	0.25	0.60	0.83	0.62	0.88	0.45	0.76	0.41	0.22	0.58	0.03	0.00	0.13	0.32	0.31	0.28
No.	20	20	20	18	14	14	11	10	8	12	4	7	1	0	1	3	2	2
Points																8	6	3

<sup>a</sup> not surveyed.

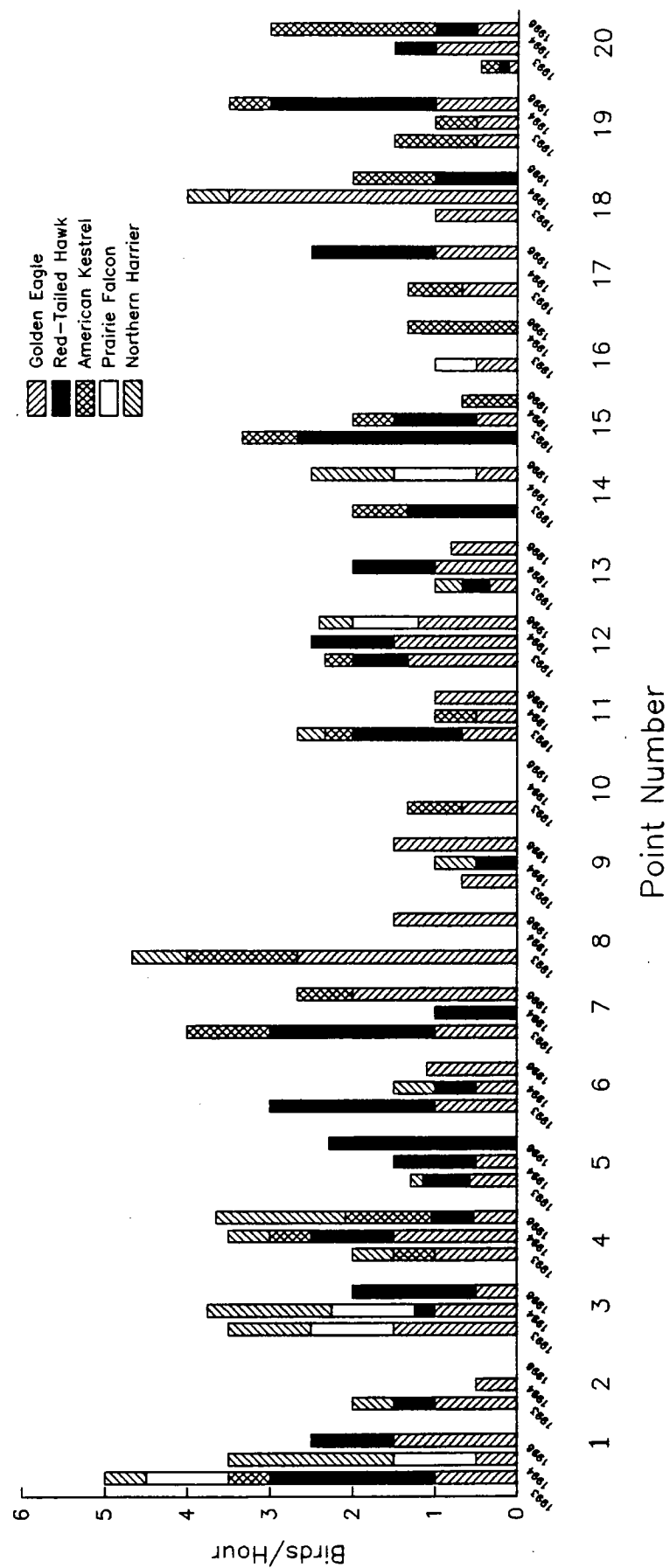


Figure 2. Raptor observation rates, lower Salmon and Snake River 1993, 1994, and 1996.

Table 4. Mean number (SD) of raptors observed/hour in 1993, 1994, 1996.

Point No.	Golden Eagle	Red-Tailed Hawk	American Kestrel	Prairie Falcon	Northern Harrier	Other	Total Raptors
1	1.00 (0.50)	1.00 (1.00)	0.17 (0.29)	0.67 (0.58)	0.83 (1.04)	0.17 (0.29)	3.83 (1.04)
2	0.50 (0.50)	0.17 (0.29)	0 (0)	0 (0)	0.17 (0.29)	0.17 (0.29)	1.33 (0.76)
3	1.00 (0.50)	0.50 (0.87)	0 (0)	0.67 (0.58)	0.83 (0.76)	0 (0)	3.17 (1.04)
4	1.01 (0.49)	0.50 (0.50)	0.68 (0.31)	0 (0)	0.85 (0.61)	0.34 (0.29)	3.72 (0.63)
5	0.36 (0.31)	1.29 (0.89)	0 (0)	0 (0)	0.05 (0.08)	0 (0)	2.26 (0.74)
6	0.86 (0.32)	0.83 (1.04)	0 (0)	0 (0)	0.17 (0.29)	0.85 (1.03)	2.71 (1.98)
7	1.00 (1.00)	1.00 (1.00)	0.56 (0.51)	0 (0)	0 (0)	0.22 (0.38)	2.78 (1.58)
8	1.39 (1.37)	0 (0)	0.44 (0.77)	0 (0)	0.22 (0.38)	0.72 (0.25)	3.44 (3.51)
9	0.72 (0.75)	0.17 (0.29)	0 (0)	0 (0)	0.17 (0.29)	0.17 (0.29)	1.22 (0.69)
10	0.22 (0.38)	0 (0)	0.22 (0.38)	0 (0)	0 (0)	0 (0)	1.33 (2.31)
11	0.72 (0.25)	0.44 (0.77)	0.28 (0.25)	0 (0)	0.11 (0.19)	0.17 (0.29)	1.94 (1.23)
12	1.34 (0.15)	0.56 (0.51)	0.11 (0.19)	0.27 (0.46)	0.13 (0.23)	0.40 (0.69)	2.92 (0.59)
13	0.71 (0.34)	0.44 (0.51)	0 (0)	0 (0)	0.11 (0.19)	0 (0)	1.38 (0.60)
14	0.16 (0.29)	0.44 (0.77)	0.22 (0.38)	0.33 (0.58)	0.33 (0.58)	0.17 (0.29)	1.89 (1.64)
15	0.17 (0.29)	1.22 (1.35)	0.61 (0.10)	0 (0)	0 (0)	0 (0)	2.00 (1.33)
16	0.17 (0.29)	0 (0)	0.44 (0.77)	0.17 (0.29)	0 (0)	0 (0)	0.94 (0.42)
17	0.83 (0.24)	0.75 (1.06)	0.33 (0.47)	0 (0)	0 (0)	0 (0)	1.92 (0.82)
18	1.50 (1.80)	0.33 (0.58)	0.33 (0.58)	0 (0)	0.17 (0.29)	0 (0)	2.33 (1.53)
19	0.67 (0.29)	0.67 (1.15)	0.67 (0.29)	0 (0)	0 (0)	0 (0)	2.00 (1.32)
20	0.54 (0.45)	0.37 (0.22)	0.74 (1.10)	0 (0)	0 (0)	0 (0)	1.69 (1.23)
All Pts.	0.74 (0.41)	0.53 (0.39)	0.29 (0.26)	0.11 (0.22)	0.21 (0.29)	0.17 (0.24)	2.24 (0.85)

abundance and distribution. The multi-species approach has enabled collection of information on all or most of the raptor species using the river canyon during the spring. The data collected 1993-1996 can be considered a baseline for long-term monitoring. No changes in raptor abundance were detected during the 3-year survey. In the future, the frequency of this multi-species survey might be reduced to every 2 to 5 years, or conducted for 3 or more consecutive years after a several year hiatus. Based on the data collected 1993-1996, this latter

technique would be more likely to detect changes in common species. The survey could also be split into shorter sections, to be surveyed annually. This would not improve the ability to detect changes, but shorter surveys could reduce potential problems with weather and observer variability. Current levels of funding do not allow hiring several people to conduct the entire river survey. Instead, observers and boat drivers assist as they are available. This means that a number of people conduct different sections of the survey every year. Shorter surveys would mean that fewer observers would be needed each year, and might reduce the variability among observers. No matter how the survey is conducted in the future, the establishment of experience or training level standards for survey participants are recommended to ensure that surveyors are limited to those with expertise in identifying raptors.

While this survey has been successful at providing information about the lower Salmon and Snake River raptor community, no peregrine falcons have been documented. Lack of peregrine falcon observations may be due to their absence, or perhaps only to their extreme rarity. Future augmentation or replacement of the 10-day river survey with ground-based surveys focusing on peregrine falcons could increase the likelihood of detecting peregrines if they are present. Historic nest sites and areas of suitable habitat could be mapped and then surveyed during the pair formation and egg-laying period in early April and/or after hatching in June.

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Appendix A  
1996 Raptor Survey Form

# RAPTOR SURVEY FORM

POINT NUMBER:

RIVER MILE:

UTM'S:

AREA DESCRIPTION:

DATE:

TIME: Start \_\_\_\_\_ Finish \_\_\_\_\_ Total \_\_\_\_\_

OBSERVERS:

WEATHER CONDITIONS:

OBSERVABILITY (amount of noise, sight limitations):

OBS. #	SPECIES	NO.	TIME	AGE	SEX	BEHAVIOR CODE, NEST LOCATION, COMMENTS
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

OTHER SPECIES OBSERVED (bird, mammal, etc...):

BEHAVIOR CODE: 0=UNKNOWN  
1=TERRITORY  
2=COURTSHIP  
3=INCUBATION  
4=NESTLINGS  
5=FLEDGLINGS

NEST LOCATION: General Description of Area and Nest, Description of Nest Site Location if Possible (UTM's, River Mile, Azimuth from known point)

ADDITIONAL OBSERVATIONS, COMMENTS:

## **Appendix B**

**Raptors Observations on the Lower Salmon and  
Snake Rivers, 29 March to 7 April 1996.**

Appendix B, Table 1.

Raptor observations on the lower Salmon and Snake Rivers, 29  
March to 7 April 1996.

Point No.	Location	UTM	Date	Hours Obs.	Observations
1	Lower Salmon RM 51.8	552700 E 5069100 N	3/29/96	2:00	2 red-tailed hawks (pair) 3 golden eagles (1 subadult) 1 accipiter (unidentified)
2	Lower Salmon Lyons Bar RM 49.6	553300 E 5072450 N	3/29/96	2:00	1 falcon (unidentified)
3	Lower Salmon Shorts Bar RM 45.3	554600 E 5078450 N	3/30/96	2:00	3 red-tailed hawks (1 pair) 1 golden eagle (adult)
4	Lower Salmon RM 44.6	553800 E 5079200 N	3/30/96	1:55	2 American kestrels (copulating) 3 northern harriers 1 golden eagle (not aged) 1 red-tailed hawk 1 falcon (unidentified)
5	Lower Salmon Pine Bar RM 42.8	552050 E 5081700 N	3/31/96	1:45	4 red-tailed hawks 1 bald eagle (subadult)
6	Lower Salmon Pine Bar RM 41.1	549900 E 5082600 N	3/31/96	1:50	2 golden eagles (pair)
7	Lower Salmon RM 37	545400 E 5084500 N	3/31/96	1:30	1 American kestrel (adult male) 3 golden eagles (adults) 1 falcon (unidentified)
8	Lower Salmon Cougar Canyon RM 32.5	542950 E 5090000 N	4/1/96	2:00	3 golden eagles (1 subadult) 2 unknown (large)
9	Lower Salmon Cougar Canyon RM 30.6	540300 E 5091200 N	4/1/96	2:00	1 falcon (unidentified) 3 golden eagles (1 subadult)
10	Lower Salmon RM 26.7	534400 E 5091400 N	4/2/96	2:00	no raptors observed

Appendix B, Table 1, cont. Raptor observations on the lower Salmon and Snake Rivers, 29 March to 7 April 1996.

Point No.	Location	UTM	Date	Hours Obs.	Observations
11	Lower Salmon RM 25.3	533050 E 5093100 N	4/2/96	2:00	1 golden eagle (adult) 1 golden eagle (not aged)
12	Lower Salmon Snow Hole Rapid RM 23.2	530700 E 5094800 N	4/3/96	2:30	1 northern harrier 3 golden eagles (2 adults; 1 not aged) 2 prairie falcons (copulating)
13	Lower Salmon Eagle Creek RM 12.7	522200 E 5093000 N	4/4/96	2:30	2 golden eagles (pair)
14	Lower Salmon Skeleton Creek RM 9.7	522000 E 5089200 N	4/5/96	2:00	2 northern harriers (pair) 1 golden eagle 2 prairie falcons (copulating)
15	Lower Salmon Slide Rapid RM 3.7	520100 E 5080700 N	4/5/96	1:30	1 American kestrel
16	Lower Salmon RM 1.3	517900 E 5078500 N	4/6/96	2:15	3 American kestrels (pair)
17	Lower Salmon Eye of the Needle RM 0.6	517050 E 5078200 N	4/6/96	2:00	2 golden eagles (1 subadult, 1 adult) 3 red-tailed hawks (1 territorial pair)
18	Snake River Confluence RM 187.8	515850 E 5078400 N	4/6/96	2:00	2 American kestrels (pair) 2 red-tailed hawks (pair)
19	Snake River Cave RM 186.8	514800 E 5079700 N	4/7/96	2:00	4 red-tailed hawks 2 golden eagles 1 American kestrel
20	Snake River Cottonwood Cr. RM 181.2	510100 E 5087000 N	4/7/96	2:00	4 American kestrels (2 pair) 1 red-tailed hawk 1 golden eagle (not aged)

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